Selkirk College chemistry instructor, Dr. Lawrence Lee, lent me "The Thirteenth Element: The Sordid Tale of Murder, Fire and Phosphorus" by John Emsley. I read it in two quick sittings.

Emsley is a chemist, historian, and the science writer in residence at both Cambridge and the Imperial College of London.

Emsley says this book is, "the first biography of a chemical element, told through the stories of a rich tableau of characters who were involved with it during its 300-year history of curious, bizarre and horrific events. Phosphorus was discovered by the alchemists, researched by the early chemists, exploited by the industrialists of the nineteenth century and abused by the combatants of the twentieth. Its capacity for evil cursed all who tried to exploit it, from the would-be murderer to the worldwide manufacturer. But set against this tale of woe are a few remarkable benefits that phosphorus brought. Still it continues to surprise, as it did in the 1990s when it was shown to be the likely cause of graveyard ghosts.

Emsley tries to bring people to chemistry. I lapped it up, but be warned that there are chemical formulae and words like phosphate, diphosphine and even phosphuretted hydrogen. The latter was attributes by novelist Charles Dickens as the cause of spontaneous human combustion.

Alchemists, the nerds of the middle ages, were the first to purify phosphorus. Pure phosphorus emits an eerie, pale-green glow which was fuel to any alchemist's fire. They were convinced that they had discovered something that turned lead into gold or offered immortality!

There is a sad chapter on nineteenth century match making. Matches replaced flints as an easier means of lighting a fire. The original strike-anywhere matches or lucifers contained phosphorus in their match heads. They could self-ignite which often proved fatal. Safety matches were a major improvement. They could only be ignited by being struck on the side of a match box. The rough side of the box, rather than the match head, contained phosphorus.

Those who made matches knew little and cared less of the effects of phosphorus on their workers. Incurable phossy jaw or the painful decomposition of a worker's jaw bone was the high risk taken to earn a meagre wage.

Emsley discusses a class of compounds called organophosphates. DNA, the blueprint for all life, is a member of this group. The lethal nerve gas, Tabun, which was stockpiled by Hitler in sufficient quantity to kill twelve trillion people is also an organophosphate. Emsley's point: don't judge a compound by its neighbours.

The most serious accident involving phosphorus was a Canadian environmental disaster: the Placentia Bay crisis of 1969. A British firm built a modern phosphorus plant in Newfoundland to be close to inexpensive hydro-electricity, raw materials and a market. Five days after opening, all of the fish in the harbour were floating dead on the surface of the bay. After adjustments to wastewater treatment processes, the plant opened again only to kill more fish. After further adjustment and near bankruptcy the plant was resuscitated. Thirty years later it seems unbelievable that a plant could be fully built without considering its environmental impact.

The book also deals intelligently with a complex environmental issue: phosphate pollution. Emsley closes that chapter by saying that phosphate recycling is possible - if not palatable. The phosphate we eat for dinner may return as phosphate for our dishwasher, which may return as phosphate in laundry detergent, which may return as phosphate in our toothpaste, which may return as phosphate in the cola we drink and so on.